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10/568,809	11/21/2006	Yoshiyuki Kitauji	062144	7235

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EXAMINER	
ROGERS, MARTIN K	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
08/06/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No.	Applicant(s)	
	10/568,809	KITAUJI ET AL.	
	Examiner	Art Unit	
	MARTIN ROGERS	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *16-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/13/2007, 9/11/2006, 2/21/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 16-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected method of extrusion, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 6/26/2006.

Applicant's election with traverse of Group 1 in the reply filed on 6/26/2009 is acknowledged. The traversal is on the ground(s) that as amended, the claims are sufficiently similar that the examination of Group I would lead to the examination of group II. This is not found persuasive because the claims still lack unity of invention. The subject matter of claim 1 is old in the art. Teutsch et al. (USP 5069612) demonstrate that it is old in the art to extrude a multilayer blown film (Column 1, line 10) from a stack of single-layer dies held in an adapter (Figure 1) housed in a main body and feed the single-layer films to an annular path (Figure 1: 144). The invention of Teutsch utilizes a temperature control circuit (Column 4, lines 29-30). The examiner notes that Teutsch utilizes electric coils rather than cartridge heaters. However, one of ordinary skill in the art would find cartridge heaters and coil heaters to be obvious alternatives.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 4 recites the limitation "said cooling air from said cooling air feeding tube flows…" in the last paragraph. There is insufficient antecedent basis for this limitation in the claim. There is no mention of a cooling air feeding tube in claim 1. Because of this, the examiner has assumed that Applicant intended to require that claim 4 be dependent on claim 3, in which a cooling air feeding tube is introduced. The claims were examined under this interpretation.

Claim 10 recites the limitation “cool 5 multi-layered thin film annular film by using said cooling airflow outputted train said annular air flow outlet.” It is unclear whether or not the Applicant is attempting to claim that the multi-layer film is required to have 5 layers. Because there is not mention of a 5-layer product in the specification, the examiner has assumed that the number 5 is a typographical error. Also, it appears that the word "train" is a typographical error as well. Therefore, the examiner has assumed that Applicant intended to claim -- cool multi-layered thin film annular film by using said cooling airflow outputted *to* said annular air flow outlet --. The claim was examined under this interpretation.

Claim Objections

Claim 12 objected to because of the following informalities: Applicant requires "said cooling water feeding tube to 5 adjust a flow rate of the first cooling water." The examiner notes that it appears that two typographical errors were made and that Applicant intended to require -- said first cooling water feed tube to adjust *a* flow rate of the first cooling water --. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Teutsch et al. (USP 5069612).

Teutsch et al. (USP 5069612) discloses an apparatus which is used to extrude a multilayer blown film (Column 1, line 10) from a stack of single-layer dies held in an adapter (Figure 1) and feed the single-layer films to an annular path (Figure 1: 144). The invention of Teutsch utilizes a temperature control circuit (Column 4, lines 29-30). Teutsch discloses electric coils rather than cartridge heaters. However, one of ordinary skill in the art would find cartridge heaters and coil heaters to be obvious alternatives.

4. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649), Lewis (USP 5389324) and Portmann et al. (USP 3839623).

In regards to claim 1, Tomoki discloses a die for creating a multilayered blown film (Figure 2) which utilizes an adapter (Figure 3: 12) and a forming die (Figure 3). The forming die has a main body (Figure 3: 13) with multiple single layer dies stacked therein (Figure 4) so that resin is fed to the die outlet by an annular path (Figure 2: 13a). In the apparatus of Tomoki, the dies are heated externally and the temperature control mechanism required by applicant is not present.

Teutsch discloses that one of ordinary skill in the art would be motivated to add individual temperature controls to each of the single layer dies for the benefit of

maintaining desired operating temperatures (Column 7, lines 33-39). Teutsch discloses that the operating temperatures are maintained through temperature sensors and a control circuit (Column 7, lines 40-44). Teutch discloses that electric coils on the periphery of the stacked structure be used to control the temperatures.

Funari discloses that one of ordinary skill in the art would consider cartridge heaters and electrical heating coils to be functionally equivalent and therefore obvious alternatives to each other (Column 7, lines 23-24).

One of ordinary skill in the art would appreciate that if cartridge heaters were used to heating the dies, then they would need to pierce the multi-layer structure, as evidenced by Lewis (Column 8, lines 46-47).

Therefore, in order to ensure that operating temperatures were maintained, one of ordinary skill in the art would have found it obvious to utilize a temperature controller (as disclosed by Tomoki) on the apparatus of Tomoki. One of ordinary skill in the art would have further found it obvious to use cartridge heaters in the temperature controller (as disclosed by Funari and Lewis).

In regards to claim 7, Tomoki further discloses that a cooling mechanism is placed downstream of the die to cool the bubble (Figure 1: 6).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649) and Portmann et

al. (USP 3839623) as applied to claim 1 above, and further in view of Dehennau et al. (USP 5601778).

In regards to claim 3, Tomoki further discloses that it is possible for a cooling air feeding tube be provided which pierces the multilayered structure and conveys cooling air through the single layer dies (Figure 2: 11) and Teutsch discloses the importance of controlling the temperature of the single layer dies. It is not disclosed that air be delivered to annular spaces in the dies.

Dehennau suggests to one of ordinary skill in the art that by equipping the single-layer dies with annular cooling channels (Figure 2: 12) and cooling fluid feeding tubes that pass vertically through the body of the extruder (Figure 1: 13), additional temperature control of the die can be achieved (Column 4, lines 24-27 and Column 2, line 55). Dehennau discloses that any well known cooling fluid can be used to cool the die (Column 4, lines 20-21). Air is well known in the art to be a cooling fluid. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the extrusion die of the previous combination with the coolant channels of Dehennau for the benefit of facilitating temperature control of the dies. One of ordinary skill in the art would have found it obvious to use the control circuit of the previous combination to control the cooling fluid of Dehennau.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record)

in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649), Lewis (USP 5389324) Portmann et al. (USP 3839623) and Dehennau et al. (USP 5601778) as applied to claim 3 above, and further in view of Briggs et al. (4798526).

In regards to claim 4, the previous combination does not disclose forming channels in the single-layer dies through the use of co-acting die halves.

Briggs discloses that by forming single-layer dies from co-acting mold halves, it is possible to use inserts to control the flow of resin from each of the individual dies (Column 5, lines 32-33). In the apparatus of Briggs, it is demonstrated that it is known to create annular resin channels through the use of co-acting half cavities in the upstream and downstream die halves. One of ordinary skill in the art applying the teaching of Briggs to the air channels of the previous combination would find it obvious to form the annular cooling fluid passages this way as well if they were present to control the temperature of the die. Therefore, one of ordinary skill in the art at the time of the invention would find it obvious to use two-part molds (as disclosed by Briggs) in the extruder of the previous combination for the benefit of being able to control the flow of resin with inserts.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649) and

Portmann et al. (USP 3839623) as applied to claim 1 above, and further in view of Ohbe et al. (Pre-Grant Publication 2003/0088053) and Rosenbaum (USP 3932102).

In regards to claim 5, Tomoki further discloses a lip portion which joins with the annular passage of the single die extruder (Figure 2: 20) and that an air nozzle be placed in the lip portion for controlling the bubble air (Figure 2: 25). Tomoki does not disclose an air reserve in the lip main body or that the lip be located at the bottom portion of the molding die.

Ohbe discloses that directing blown films either upwardly or downwardly are obvious equivalents ([0084]). Therefore, it would have been obvious to one of ordinary skill in the art to arrange the extruder to Tomoki such that the lip is directed downwardly.

Rosenbaum discloses that the process of controlling the temperature of an extrusion die is facilitated by creating air reserves in the die (Column 4, lines 57-59). Rosenbaum further discloses that this air reserve be located in the lip portion (Figure 1: 106), said air reserve being fed bubble air (Figure 1: 81) and discharging the air to the interior of the blown bubble (Figure 1: 104). One of ordinary skill in the art would appreciate that the flow of air passing through the air reserving section would influence the temperature of the die lip due to convective cooling. It would therefore be obvious to control the bubble air flowrate with the same temperature controller of claim 1.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to direct the lip of the extruder of Tomoki downward (as disclosed by Ohbe). It would have further been obvious to use the air supply tube of Tomoki to

supply air to a reserve chamber in the lip and the nozzle of Tomoki to release bubble air from the reserve chamber for the benefit this empty space in the mold die making it easier to control the die temperature (as disclosed by Rosenbaum).

In regards to claim 6, Rosenbaum further discloses that band heaters (Figure 1: 120) be used in conjunction with the air reserve chamber in order to adjust the temperature of the die. It would be obvious to one of ordinary skill in the art to use the temperature controller of claim 1 to also control the band heaters of the lip.

Claims 8, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649) and Portmann et al. (USP 3839623) as applied to claim 1 above, and further in view of Schell (USP 6964816) and Applicant's admitted prior art.

In regards to claim 8, Tomoki further discloses that an air ring positioned downstream from the die be used to cool the bubble (Figure 1: 6). Tomoki does not disclose the use of an additional two cooling mechanisms.

Schell discloses that it is well known that extruded film bubbles can be cooled by any combination of well known exemplary cooling methods (Column 7, lines 47-49), suggesting to one of ordinary skill in the art that it would be obvious to add additional well-known cooling mechanisms to the device of Tomoki.

Applicant admits in the prior art that in addition to air-cooling, it is well known to use cascading water to cool the bubble (Page 5, lines 24-25). Applicant further admits it is well known to utilize sprayed water to cool a blown film (Page 6, lines 24-26). Therefore, one of ordinary skill in the art at the time of the invention would find it obvious to use the water-cooling steps disclosed by Applicant in addition to the air cooling disclosed by Tomoki for the benefit of it being well known in the art to use a combination of cooling structures on a blown film (as disclosed by Schell).

In regards to claim 12, Applicant further discloses in the admitted prior art that the cascading water cooling mechanism be regulated by feedback control such that the flowrate of water supplied though a feeding tube, the temperature of the water emerging from a heat exchanger (Figure 2: 205) and the height of a weir in the water reservoir (figure 2: 204) all be optimized (Page 6, lines 2-6). The examiner notes that Applicant states that it is known in the prior art that control of the cooling mechanism involves "detection of the overflow height of an overflow weir" (Page 6, lines 4-5). One of ordinary skill would appreciate from this that the height of the weir is therefore not fixed and must be adjustable.

In regards to claim 14, Applicant discloses that for the second cooling mechanism (which uses cascading water), it is well known in the art to supply water through a duct (Figure 2), control the flow of the water (Page 6, line 3), and control the temperature of the water with a heat exchanger (Page 6, lines 3-4). For the reasons

given above in claim 8, it would have been obvious to the skilled artisan to include a plurality of water sprays which are directed water around the circumference of the extruded films. One of ordinary skill would find appreciate that if there is a benefit to adjusting the flow characteristics of the water in the second cooling mechanism, then there would be a similar benefit in optimizing the water of the third cooling mechanism. Therefore, one applying the teachings of Applicant's admitted prior art to the water spray cooling mechansim would find it obvious to optimize the same required variables.

Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649), Lewis (USP 5389324) Portmann et al. (USP 3839623), Schell (USP 6964816) and Applicant's admitted prior art as applied to claim 8 above and further in view of Havens (USP 4101614).

In regards to claim 9, Tomoki is silent as to any control mechanism on the cooling device.

Havens discloses that the quality of an extruded film can be improved (Column 1, lines 43-45) by using a radiation thermometer (Column 4, line 8) to implement a feedback control on the flowrate of cooling air supplied to the extruded bubble (Column 4, line 26). Therefore, in order to ensure high quality, one of ordinary skill in the art

would be motivated to use a feedback control (as disclosed by Haven) with the apparatus of the previous combination.

In regards to claim 11, Applicant discloses that it is known in the prior art to control the flow rate of cascading cooling water based on a feedback controller (Page 6, line 5), however Applicant is silent as to the type of sensor used in the feedback controller, suggesting to one of ordinary skill in the art that any well known tempearture sensor would be suitable.

Havens discloses that it is well known to use radiation thermometers (Column 4, line 8) as the sensors in feedback controls for blown film cooling mechanisms. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize an infrared thermometer (as disclosed by Havens) in the feedback controller disclosed by Applicant for the benefit of this being a well known sensor for use in such a control circuit.

Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649), Lewis (USP 5389324) Portmann et al. (USP 3839623), Schell (USP 6964816) and Applicant's admitted prior art as applied to claim 8 above and further in view of Joseph (Pre-Grant Publication 2001/0023998).

In regards to claim 10, Tomoki is silent as to any adjustability of the flow or temperature of the cooling air.

Joseph discloses that it is well known in the art to adjust the temperature and flow of cooling air through a supply duct ([0005]) in a blown film process for the benefit of controlling the thickness and dimensions of the product ([0004]). Therefore, one of ordinary skill in the art at the time of the invention would find it obvious to adjust the temperature and flow of the cooling air in Tomoki for the benefit of controlling the thickness and dimensions of the multi-layered product. The examiner notes that Joseph is silent as to how the temperature of the air is adjusted, suggesting to one of ordinary skill in the art that any well known method of adjusting the temperature of a cooling fluid would be suitable.

Applicant admits that it is well known in the prior art to use a heat exchanged to adjust the temperature of a cooling fluid (Page 5, line 27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a heat exchanger (as disclosed in Applicant's admitted prior art) to control the temperature of the air for the benefit of this being well known device for this purpose.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649), Lewis (USP 5389324) Portmann et al. (USP 3839623), Schell (USP 6964816) and Applicant's

admitted prior art as applied to claim 8 above and further in view of Ohya et al. (USP 4525414).

In regards to claim 13, the previous combination does not disclose a dewatering device associated with the bubble cooling mechanisms.

Ohya discloses that by placing a dewatering device between cooling mechanisms (Figure 1: 5) it is possible to use cooling water of different temperatures for the different cooling mechanisms (Column 4, lines 38-41 and Column 11, lines 11-14) and therefore perform a biaxial stretching operation to achieve a desired properties in the film (Column 4, lines 32-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a dewatering apparatus (as disclosed by Ohya) with the apparatus of the previous combination for the benefit performing a stretching step on the film as it is cooling. Although Ohya does not explicitly disclose that the dewatering apparatus be vertically adjustable, one of ordinary skill in the art would appreciate that the position of the dewatering apparatus would effect the cooling time and therefore the degree of cooling. Applicant discloses in the admitted prior art that it is well known to adjust that parameters of a cooling mechanism in order to optimize a process (Page 6, lines 2-7). One applying the teachings of Applicant's prior art to the dewatering apparatus of Ohya would find it obvious to adjust the height of the watering station in order to further optimize the cooling of the bubble.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the previous combination of Tomoki et al. (Japanese Kokai 2002-079576 already of record) in view of Teutsch et al. (USP 5069612), Funari et al. (USP 5222649) and Portmann et al. (USP 3839623) as applied to claim 1 above, and further in view of Briggs et al. (USP 4798526).

In regards to claim 15, Tomoki further discloses the use of several identically sized frustoconical single dies (Figure 4) with downstream portion that locks into adjacent upstream recesses (Figure 4). In the die of Tomoki, resin is fed from the upstream face of the single layer dies and as the resin moves downstream into the annular extrusion passageway, it encounters a radial path (Figure 4: 14-17j) and spiral paths (Figure 4: 14-17c) formed in the side face of the truncated conical portions. Tomoki does not disclose that the dies have upstream and downstream sides.

Briggs discloses that by forming single-layer dies from co-acting mold halves, it is possible to use inserts to control the flow of resin from each of the individual dies (Column 5, lines 32-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the single-layer dies of Tomoki from upstream and downstream parts (as disclosed by Briggs) for the benefit of being able to control the extrusion rates with inserts.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARTIN ROGERS whose telephone number is 571-270-7002. The examiner can normally be reached on Monday through Thursday, 7:30 to 5:00, and every other Friday, 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MR

/Richard Crispino/
Supervisory Patent Examiner, Art Unit 1791